



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: February 26, 1999

In reply refer to: H-99-9

Honorable Ricardo Martinez, M.D.
Administrator
National Highway Traffic Safety Administration
400 7th Street, SW
Washington, D.C. 20590

As a result of its findings in two fatal motorcoach accidents in 1995 and 1997, the National Transportation Safety Board conducted a special investigation of motorcoach safety. The report of the investigation addresses, among other safety issues, emergency egress.¹

In the case of the second accident, which occurred on July 29, 1997, a 1985 TMC (Transportation Manufacturing Corporation) motorcoach operated by Rite-Way Transportation, Inc., (Rite-Way) and occupied by a driver and 34 members of the Pathways to Freedom tour group drifted off the side of Interstate (I)-95 near Stony Creek, Virginia, and down an embankment into the Nottoway River, where it came to rest on its left side in 5 to 6 feet of water. One passenger sustained fatal injuries, the driver and 3 passengers sustained serious injuries, and 28 passengers sustained minor injuries.

Because the bus was overturned and partially submerged, passengers had to evacuate by standing on the seats, pushing up on the emergency windows, and climbing out and onto the top of the bus. Each of the emergency windows on the bus was hinged at the top, allowing the window to swing open when the emergency release bar was activated. Postaccident tests performed by the manufacturer indicated that an upward force of 85 pounds was needed to fully open an emergency exit window with the coach lying on its side.

Some passengers said that, because of their height or the window weight, they were unable to push the windows open after unlatching them. Because the bus was on its side, several passengers had difficulty keeping the windows open. The windows had to be pushed open and back until they rested on the side of the vehicle, a rotation of 180 degrees, to prevent them from closing on the escaping passengers. Thus, the individual opening the window not only had to have sufficient strength to push it open, but also sufficient height and arm length to rotate the window to this degree. Many passengers, some of whom were as young as 11, indicated that they had

¹For addition information, refer to Special Investigation Report—*Selective Motorcoach Issues* (NTSB/SIR-99/01).

difficulty evacuating the vehicle. Injured passengers particularly had problems evacuating through the emergency windows.

For more than 30 years, the Safety Board has been addressing the issue of passengers having difficulty with emergency evacuations of motorcoaches. On December 18, 1968, as a result of its investigation of the March 7, 1968, coach-automobile collision on I-15 near Baker, California, in which 19 people died and 12 people were injured,² the Safety Board issued Safety Recommendation H-68-25 to the Federal Highway Administration (FHWA), which states:

Change the basis of regulatory requirements intended to ensure escape from buses so that they are based upon tests of performance of occupants in escaping from buses standing or lying in all basic attitudes. In the development of test criteria, it is suggested that consideration be given to test procedures presently employed by the Federal Aviation Administration [FAA] for the regulation of the adequacy of escape techniques and systems. Further, consideration should be given to adopting for buses, the airline practice of placing emergency escape instructions at each passenger location. It is further recommended that necessary regulations be expedited to ensure that no new types of buses go into service which have not been tested to ensure that all occupants can escape rapidly when the bus is in any of its basic attitudes after a crash. This recommendation refers to docket 2-10 of the National Highway Safety Bureau, as well as to Motor Carrier Safety Regulations.

In a letter dated January 17, 1969, the FHWA responded that developing the contemplated regulations from performance-based emergency escape tests would take time because of the numerous bus configurations in existence. The agency indicated that research was being planned “to correlate escape operations from on-side attitude with on-wheels condition.” It also stated that it was using FAA airworthiness standards to develop an escape demonstration technique for buses.

On March 19, 1970, as a result of its investigation of the December 26, 1968, motorcoach crash on I-80S near Beaver Falls, Pennsylvania, in which 3 people died and 36 people were injured,³ the Safety Board issued Safety Recommendation H-70-9 to the FHWA, which states:

Review our recommendation in the report of the interstate coach-auto collision near Baker, California, to change the basis of its regulatory requirements intended to ensure escape from buses standing or lying in all basic attitudes. In the development of test criteria, it is suggested that consideration be given to test procedures presently employed by the FAA for the regulation of the adequacy of escape techniques and systems. Further, consideration should be given to adopting for buses, the airline practice of placing emergency escape instructions at each

²See Highway Accident Report—*Interstate Bus--Automobile Collision, Interstate Route 15, Baker, California, March 7, 1968* (NTSB/SS-H-3).

³See Highway Accident Report—*Chartered Interstate Bus Crash, Interstate Route I-80S Near Beaver Falls, Pennsylvania, December 26, 1968* (NTSB/SS-H-5).

passenger location. It is further recommended that necessary regulations be expedited to ensure that no new types of buses go into service which have not been tested to ensure that all occupants can escape rapidly when the bus is in any of its basic attitudes after a crash. This recommendation refers to docket 2-10 of the National Highway Safety Bureau, as well as to Motor Carrier Safety Regulations.

The FHWA advised the Safety Board on August 23, 1973, that Federal Motor Vehicle Safety Standard (FMVSS) 217, specifying requirements for window retention, emergency release handles, and passenger escape, would be effective on September 1, 1973.

Shortly thereafter, the Safety Board investigated the November 3, 1973, accident near Sacramento, California, in which a 1953 GMC motorcoach operated by Greyhound Lines, Inc., (Greyhound) ran off the left side of I-880, overrode a guardrail, and collided with a bridge column. The driver and 12 passengers sustained fatal injuries, 22 passengers sustained serious injuries, and 11 passengers sustained minor injuries.⁴ Although the bus remained upright, passengers reported that they had difficulties getting out because it was dark, they were confused and jammed between seats, and the windowsill was 8 feet from the ground. In addition, some passengers stated that “the windows were heavy and that there was no way to hold them open.”

Since the 1968 and 1973 accidents, the Safety Board has investigated several other accidents in which a bus left the roadway and either rolled or vaulted into water and the passengers had difficulty evacuating. On May 30, 1986, a motorcoach chartered for a tour rolled over 360 degrees into the Walker River.⁵ Of the 41 occupants, mostly senior citizens, 21 were fatally injured. Seven of the 21 fatally injured passengers drowned.

More recently, on August 2, 1996, a 1980 TMC motorcoach operated by Greyhound drove off the right side of I-95 and came to rest upright in Chockoyotte Creek near Roanoke Rapids, North Carolina.⁶ The bus was submerged in water up to the bottom of the push-out emergency windows. Some passengers exited through the push-out windows; others exited through the broken windshield. Several passengers indicated that people were screaming and there was a state of panic. One passenger stated that “the bus windows wouldn’t stay open, so we all had a hard time getting out.” Of the 50 occupants, 19 sustained minor to serious injuries.

As the Stony Creek accident illustrates, the emergency exit windows are very difficult to operate in an evacuation when a motorcoach is not upright. In particular, some children and those with minor injuries were not tall or strong enough to push the heavy emergency windows open far enough to evacuate. The Safety Board therefore concluded that the strength and height needed to

⁴See Highway Accident Report—*Greyhound Bus Collision with Concrete Overpass Support Column on I-880, San Juan Overpass, Sacramento, California, November 3, 1973* (NTSB-HAR-74-5).

⁵See Highway Accident Report—*Intercity Tour Bus Loss of Control and Rollover into the West Walker River, Walker, California, May 30, 1986* (NTSB/HAR-87/04).

⁶See NTSB Docket Number SRH-96-FH-015.

open an emergency window when a motorcoach is not upright poses a problem for some passengers, especially children, senior citizens, and some injury victims.

Although the number of rollover accidents is relatively small, the increased chance of injury is dramatic. Of 42 motorcoach accidents involving fatalities that the Safety Board investigated between 1968 and 1998, more than 50 percent were rollover accidents.

The Safety Board is convinced that, to facilitate emergency evacuations, emergency exits and windows should be designed so that they do not open accidentally during normal use and accident sequences, but do open easily when the vehicle comes to rest.

Therefore, the National Transportation Safety Board recommends that the National Highway Traffic Safety Administration:

Revise the Federal Motor Vehicle Safety Standard 217, "Bus Window Retention and Release," to require that other than floor-level emergency exits can be easily opened and remain open during an emergency evacuation when a motorcoach is upright or at unusual attitudes. (H-99-9)

Also, the Safety Board issued Safety Recommendations H-99-4 through -8 to the U.S. Department of Transportation, H-99-10 through -14 to the American Bus Association, and H-99-15 through -18 to the United Motorcoach Association.

Please refer to Safety Recommendation H-99-9 in your reply. If you need additional information, you may call (202) 314-6484.

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in this recommendation.

By: Jim Hall
Chairman